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# Introduction

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First SBND-DUNE Workshop

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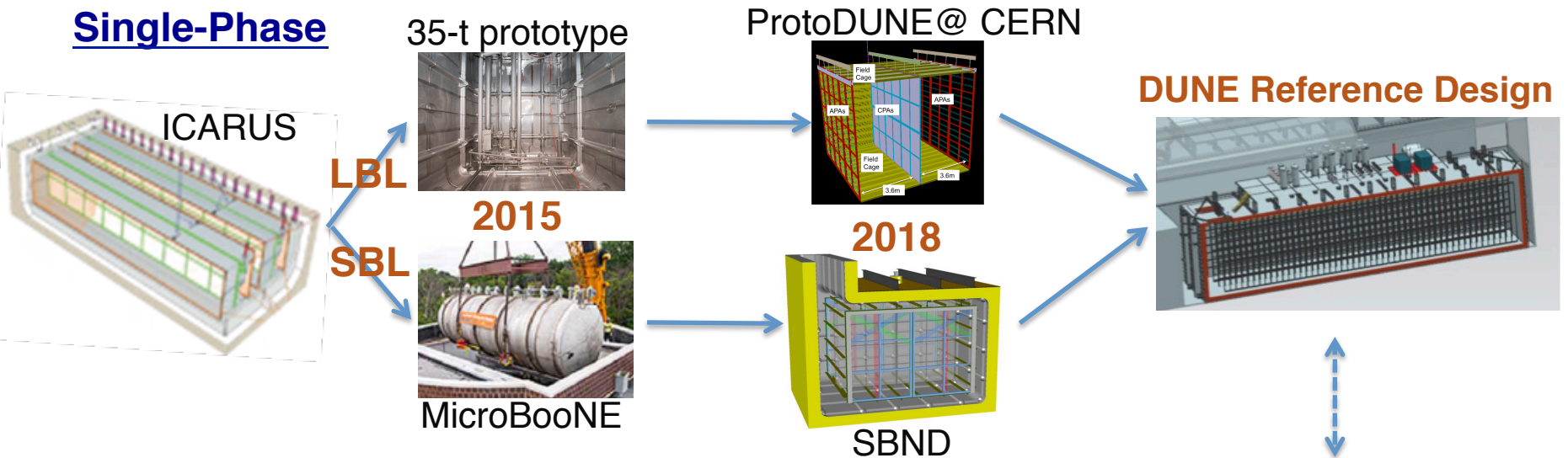
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# LArTPCs seen from DUNE

Fermilab SBN and CERN neutrino platform provide a strong LArTPC development and prototyping program

## Single-Phase



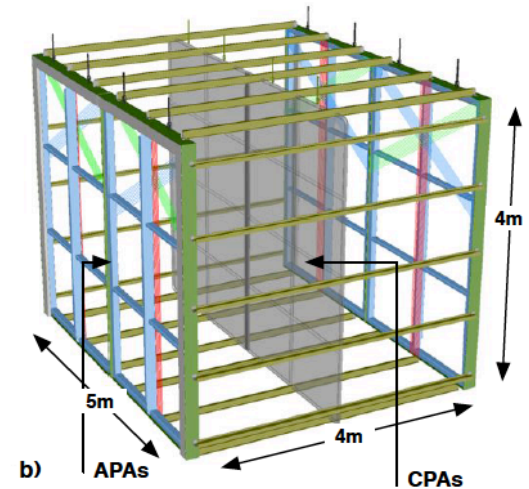
## Dual-Phase



# SBND and ProtoDUNE

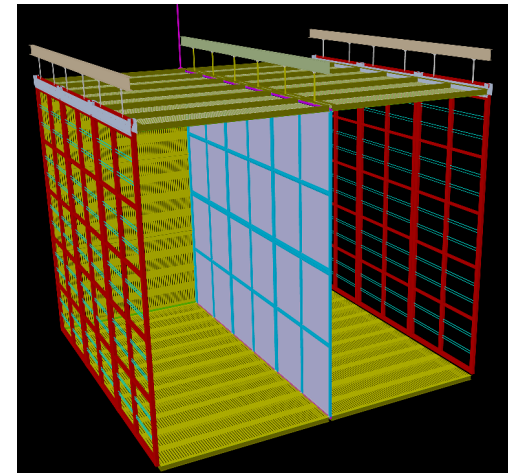
## SBND

- **Single-Phase LAr-TPC**
  - Four anode planes
  - Cold electronics
  - Operational at Fermilab in 2018
  - Construction/Installation: 2016 – 2018



## ProtoDUNE

- **Single-Phase LAr-TPC**
  - Six wrapped anode planes
  - Cold electronics
  - Operational at CERN in 2018
  - Construction/Installation 2016 – 2018



# SBND and ProtoDUNE

**ProtoDUNE is an engineering prototype for DUNE...**

- **Specifically the engineering prototype for first DUNE 10-kt module**
  - Essentially “full-size” prototype of TPC drift cells of far detector
  - Ideally, design mimics that of the far detector
  - Little time for R&D (at least for first 10 kton)

## **SBND as R&D for DUNE?**

- **Main aim of SBND is short-baseline science program**
- **SBND provides the opportunity to operate a DUNE-style detector in a neutrino beam**
- **SBND could also provide R&D opportunities for DUNE**
  - SBND/ProtoDUNE timescales are concurrent
  - Often the same people/groups involved





# SBND and ProtoDUNE: Synergies

## SBND and ProtoDUNE

- Many similarities/synergies
  - Modular anode planes
  - Cold electronics
  - ...
- Overlapping set of people...

Positive or negative interference?

**There are potential benefits to both SBND and DUNE in exploiting the similarities/synergies**

- More effective use of resources (which are likely to be stretched)
  - Financial
  - Scientific/Engineering Effort

# Goal of this Workshop

## Investigate potential for direct SBND/DUNE collaboration

- Are there aspects where SBND and ProtoDUNE can work together?
- At this workshop – focus on the detector hardware:
  - Cold electronics
  - TPC (anode and cathode planes)
  - Field Cage
  - Photon Detection System
- Envision future workshops focusing on other aspects
  - DAQ
  - Offline Software
  - Connection between physics programs of SBND/ProtoDUNE/DUNE

# Format of workshop

## Short Presentations + Plenty of Discussion

- **For each of the following topics**
  - Cold electronics
  - TPC (anode and cathode planes)
  - Field Cage
  - Photon Detection System

### **we should be asking the questions:**

- Are there components where SBND and ProtoDUNE sufficiently similar that a common design or approach could be adopted?
  - If so there may be significant benefit to working together
- What are the synergies and how can they be exploited?
- Are there aspects of SBND that can provide essential R&D for DUNE?

# Any Questions?